

On Open Systems and Openness

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Open Systems

An Open System is a modular construction where the components are built to Open Standards. The standards will normally be the responsibility of Standards Bodies or otherwise be publicly available.

The key benefit of an Open System is that it is built from components that can be readily removed and replaced by multiply-sourced alternatives and so many suppliers can compete for that business. The consumer is thus offered security of supply and through-life cost savings.

That the components can be readily replaced requires that their interfaces are well defined and that they are Open to scrutiny. This in turn requires an Open Architecture. Both the Architecture and the Interface Standards have governance and ownership characteristics that must be determined appropriately if an Open System is to be successful.

Open Standards.

Necessarily, the need for plug-compatibility implies that the interfaces between the interoperable components are built to Open Standards.

By Open Standards we mean standards that have been fully documented and are (usually) arrived at by consensus among the users and suppliers of components that need to interoperate.

It is not just the interfaces that need definition, however. The behaviour of the components also needs to be defined as part of the description of the semantics of the interfaces.

Standards Bodies.

Consequently, one of the most notable aspects of an Open System is the existence of Standards Bodies, the forums of users and suppliers where the standards are agreed and evolved.

Many of the standards in an Open System are public standards that are governed by existing standards bodies. But, within an application domain the standards are domain specific we will need to have a standards body which is responsible for the Architecture and Open Standards in that domain.

Openness.

Openness is a measure of the extent to which a system comprises components that are built to Open Standards. The Openness of a system can then be defined by the

extent to which the components from which it is built implement Open Standards. A system is more Open the more independent sources of supply actually exist.

Potentially, a reasonable measure of Openness is the minimum number of suppliers who, by forming a cartel, can control a customer's ability to independently evolve a system. In general it is desirable that this number is greater than one.

Open Source

Open Source should not be confused with Open Systems. Open Systems can be built from closed source components.

However, in the context of Open Systems it is important to also look at the benefits of Open Source.

Where a component is supplied along with all its source code, we have some increased confidence in our ability to control its evolution.

So, Open Source components don't need to implement Open Standards, because they carry within them the specification of the interfaces that they implement. In that case you could say that the source is the definition of the interface (just not the most efficient one)

However, it is often the case that Open Source components do implement Open Standards and so, while the concepts are clearly distinct, they are often confused.

The benefits of Open Source have been well documented. Many of these benefits relate to the high quality that can be achieved by a properly coordinated Open Source Development Process.

Open Systems can realize many of the benefits of Open Source

Also, the business models around open source, whereby companies make better returns on the chargeable services and products, mostly also apply to Open Systems.

Many of the benefits discovered by the larger Open Source projects also apply to the broader domain of Open Systems, where only the interfaces rather than the sources are made public.

These benefits include the type of business model that a supplier of components for an Open System might adopt in order to increase their revenue (largely by creating a market) while at the same time giving the customer more choice and lower through life costs.

Reference.

Peter Henderson, *Notes on Architecture Description for Open Systems*,
<http://openpdq.com/architecture>